DOCUMENT RESUME

ED 237 937 CS 007 421

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TITLE Reading Comprehension and Related Characteristics of U.S. Navy Recruits: A Twelve-Month Description.
PUB DATE Nov 83
NOTE 23p.; Paper presented at the Annual Meeting of the Mid-South Educational Research Association (12th, Nashville, TN, November 16-18, 1983).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Aptitude Tests; Educational Experience; Education Work Relationship; High School Graduates; Personnel Needs; *Reading Achievement; *Reading Comprehension; Reading Research
IDENTIFIERS Armed Services Vocational Aptitude Battery; Gates MacGinitie Reading Tests; *Navy

ABSTRACT

A study investigated the relationships among educationally related characteristics and month of service entry for 77,347 Navy recruits who entered the Navy between June 1982 and May 1983. Data were obtained from monthly Computer Managed Instruction (CMI) reports on Navy recruit characteristics and performance on the Gates-MacGinitie Reading Comprehension Test and the Armed Services Vocational Aptitude Battery. In addition to indicating that the typical Navy recruit had completed almost 12 years of school, the results suggested that aptitude did not vary in any consistent pattern among recruits with reading grade level (RGL) scores below 6.0, but seemed to show a pattern among recruits with reading grade scores above 6.0. Findings also showed score differences among recruits with RGL scores below 6.0 when classified by high school graduation status and month of entry into the Navy. Higher percentages of the recruits who scored below 6.0 on the RGL were high school graduates in the earlier and later months of the test period than in middle months. A higher proportion of the composite group of high school graduate recruits scored below the 6.0 RGL than was found in the composite group of nonhigh school graduate recruits. The study indicates that recruits who enter the Navy in different months of the year are likely to vary on some important factors, and that personnel need to plan for adjustments in the requirements for resources as the recruit population changes throughout the year. (HTH)

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READING COMPREHENSION AND RELATED CHARACTERISTICS OF U.S. NAVY RECRUITS: A TWELVE-MONTH DESCRIPTION

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Paper presented at the Twelfth Annual Meeting of the Mid-South Educational Research Association in Nashville, Tennessee, November 16-18, 1983

Introduction

In June, 1978, the Secretary of the Navy issued a statement of policy in Instruction 1510.3 that addressed the need for remedial training in basic educational skills among some personnel as a necessity for the Navy to achieve its mission (12). The official position stated in the Instruction is that "It is the policy of the Department of the Navy to provide, when indicated, on-duty remedial job-relevant basic skills training in order to fill personnel requirements" (12:1). The definition of job-relevant basic skills is "those capabilities prerequisite to efficient completion of Navy training programs, adequate job performance and career advancement. Notable among these are literacy, study and computational skills" (12:1).

In addition to the development of new programs as a result of the policy statement, fundamental skills training programs that were already operational were given official sanction at the highest organizational level in the Navy. One of the operational programs, Academic Remedial Training (ART), provides instruction for recruits in basic reading and verbal skills that are essential to complete the demanding academic requirements of recruit training. The ART Program was initiated officially by the Naval Technical Training Command in 1967 at the Navy's three Recruit Training Centers as a remedial reading course. The courses at the three sites evolved with highly dissimilar curricula and testing plans due to the autonomy permitted in course development.

The Chief of Naval Technical Training standardized the reading curriculum and testing procedures of ART by issuing Instruction 1540.42 (8) in August, 1978, and implementing a prescribed curriculum (5) in October, 1978, that was subsequently revised (6). A verbal skills curriculum (7) that focuses on listening and speaking skills primarily for recruits who speak English as a second language was added to the program at the Orlando and San Diego Recruit Training Centers in 1981. The ultimate purpose of ART has been and continues to be the provision of assistance to recruits in the acquisition of the language skills required to complete recruit training successfully.

Coincident with the standardization of the ART reading course, a requirement was introduced that involved use of a Computer-Managed Instruction (CMI) system to perform test scoring functions and to maintain records containing data on recruits. The CMI system is utilized in scoring the screening, diagnostic, and criterion tests prescribed for the reading component of ART. The records that are created are used to prepare monthly CMI reports on the educationally related and reading comprehension characteristics of the total recruit accessions for the period.

Problem

The problem defined for this study was to investigate the educationally related characteristics and relationships among selected variables that describe the Navy's recruit population. The recruits who entered the Navy between June, 1982, and May, 1983, were the subjects who provided the data to address the problem. The variable of primary interest was the recruit's grade level score on reading comprehension. Other variables employed in the study were years of education, aptitude score, high school graduation status, and month of entry into the Navy.

Hypotheses

In addition to the performance of descriptive analyses on selected variables, six null hypotheses were formulated to test statistically the differences among recruits on particular variables. These hypotheses were as follows:

1. There are no differences in the distributions of recruits classified by reading grade level (RGL) category and month of entry into the Navy.
2. There is no difference in the distributions of recruits classified by high school graduation status and month of entry into the Navy.
3. There is no difference in the distributions of high school graduate recruits classified by the 6.0 RGL criterion and month of entry into the Navy.
4. There is no difference in the distributions of non-high school graduate recruits classified by the 6.0 RGL criterion and month of entry into the Navy.
5. There is no difference in the distributions of recruits scoring below the 6.0 RGL criterion classified by high school graduation status and month of entry into the Navy.
6. There is no difference in the proportions of high school graduate and non-high school graduate recruits who score below the 6.0 RGL criterion.

The .05 level of significance was used in testing the hypotheses.

The significance of the study is based on two considerations. First, the results could identify factors on which the recruit population varies across a twelve-month period. Such information would be useful to ART Program management personnel in planning for the allocation and utilization of resources (e.g. staff, facilities, and instructional materials) more efficiently. In particular, variability in the numbers of recruits needing reading remediation would have a direct effect on the requirements for staffing and instructional materials. Second, this study could demonstrate the desirability of using CMI system data to monitor and manage the ART Program. Since these data are reported routinely to program management personnel, the data are readily available to use in making decisions regarding program needs and operations.

Related Research

A variety of research studies have been conducted on the reading skill levels of Navy enlisted personnel and training materials because of the importance of reading skills for success in training and job performance. Hoiberg, Hysham, and Berry (10) reported a significant relationship between reading skills and successful completion of the first enlistment term in the Navy. Biersner (1) found that many Navy training manuals are written at the twelfth grade readability level or higher. Zierdt (15) and Sticht (13) concluded that the reading abilities of many recruits do not meet the skill requirements of widely used Navy materials.

Several studies have described the reading skill levels of the Navy recruit population based on the Gates-MacGinitie Reading Tests. Duffy and Nugent

(9) found a median RGL of 11.9 on comprehension as a result of testing 31,575 recruits at the Recruit Training Center in San Diego between May, 1974, and May, 1975. The data showed that 2.8 percent of the recruits scored below the 4.0 RGL and 9.6 percent scored below the 6.0 RGL. They concluded that the reading skill levels of many recruits are well below the readability levels of the print materials used in recruit training and daily job tasks.

Bowman and Kerr (3) reported that a sample of 14,503 recruits tested in the first few months of 1979 had a median RGL of 11.0 on comprehension while 1.1 percent scored below the 4.0 RGL and 5.2 percent scored below the 6.0 RGL. In a one-year study (4), they found that 79,350 recruits who entered the Navy between June, 1980, and May, 1981, had a median RGL of 11.0 on comprehension with .7 percent scoring below the 4.0 RGL and 4.3 percent scoring below the 6.0 RGL. In a subsequent study (2) based on 84,123 recruits who entered the Navy between June, 1981, and May, 1982, they reported a median RGL of 11.2 while .5 percent scored below the 4.0 RGL and 3.6 percent scored below the 6.0 RGL.

The research studies indicate that reading skills are strongly related to the success of Navy enlisted personnel while the readability levels of many training and job materials are very demanding with respect to the skill levels required for their use. Descriptive research data reveal that the reading comprehension levels of recruits declined between 1974-75 and 1979. Later studies suggest that the median reading comprehension level of recruits may have begun to increase after a brief period of stability at approximately the eleventh grade level.

Procedures

The data utilized in this study were obtained from the monthly CMI reports on Navy recruit characteristics and test performance. Data were available on 77,347 recruits who entered the Navy between June, 1982, and May, 1983. The reports provided data on four variables used in this study: years of education, high school graduation status, aptitude test score, and reading comprehension grade level score. A fifth variable, month of entry into the Navy, was defined by the month for which each report was prepared.

The Gates-MacGinitie Reading Comprehension Test (11) and the Armed Services Vocational Aptitude Battery (14) are the two tests for which data were reported. The Gates-MacGinitie, Levels D-F, is used as a screening instrument with all recruits who enter the Navy. (Only Level D was used prior to November, 1982.) An algorithm is used with the paragraph comprehension and verbal expression scores from the Armed Services Vocational Aptitude Battery to estimate the reading skill level of each recruit and to assign the appropriate level of the Gates. The recruits who score below the 6.0 RGL on the first administration of the Gates are retested with an alternate form of Level D. (The data from the first administration of the Gates are used in this study.) Recruits who score below the 6.0 RGL on the second administration of the Gates are candidates for assignment to ART.

The Armed Services Vocational Aptitude Battery (ASVAB) is administered to all recruits before they enlist in the Navy. The recruits included in this study had taken one of two series of ASVAB tests: Series 5-7 or Series 8-10.

The aptitude score used in the study was the Armed Forces Qualification Test (AFQT) score. The AFQT is a normative percentile score that is derived from a composite of selected ASVAB scores. The scores used in the composite for ASVAB series 5-7 are the word knowledge, numerical operations, and space perception scores. On ASVAB series 8-10, the composite uses the word knowledge, paragraph comprehension, arithmetic reasoning, and numerical operations scores.

The monthly CMI reports provided means for years of education, AFQT scores of recruits classified by the 6.0 RGL criterion (above or below), and RGL scores. The median was calculated for RGL scores by month. Frequency distributions were compiled and percentage distributions were computed for all recruits on RGL categories, high school graduation status, and combinations of the variables on high school graduation status and the 6.0 RGL criterion. Proportions were calculated for high school graduate and non-high school graduate recruits who scored below the 6.0 RGL criterion.

A tabular format was used to present the means and medians as descriptive statistics. The Chi-square technique and confidence limits for proportions were employed for the analyses related to testing the hypotheses. The Chi-square procedure provided comparisons of frequency distributions for RGL scores, high school graduation status, and the 6.0 RGL criterion and high school graduation status by month of entry into the Navy. Confidence interval limits were computed to compare the proportions of high school graduates and non-high school graduates who scored below the 6.0 RGL by month and composite group.

Results

The results of the study are reported in a series of nine tables. The descriptive data are depicted in the first three tables. The remainder of the tables present the data and results of the inferential analyses related to the hypotheses.

Descriptive Data

Table 1 contains the means on years of education by month of entry into the Navy for the recruits. The composite mean for the one-year time span was 11.9 years of education. The monthly means ranged from 11.8 years to 12.0 years. While the limits of the range differ by only .2 month, a trend of higher means was evident across the twelve-month period.

The means in Table 2 are based on the AFQT percentile scores of recruits classified by the 6.0 RGL criterion and month of entry into the Navy. The composite means were 37.6 for all recruits who scored below the 6.0 RGL criterion and 59.8 for all recruits who scored above the 6.0 RGL criterion. Among the recruits with RGL scores below 6.0, the monthly means varied from 32.7 in July, 1982, to 48.1 in November, 1982. Among the recruits with RGL scores above 6.0, the means ranged increasingly by month from 57.4 in July, 1982, to 63.8 in May, 1983. The difference in the composite means for the low and high RGL groups was approximately 22 percentile points. The differences by month were relatively stable, remaining within the range of 20 to 25 points. The data suggest

TABLE 1

MEANS ON YEARS OF EDUCATION FOR RECRUITS BY MONTH OF ENTRY

Month	N	Mean
June, 1982	7,660	11.8
July, 1982	7,461	11.8
August, 1982	9,460	11.9
September, 1982	8,026	11.8
October, 1982	6,335	11.8
November, 1982	6,893	11.8
December 1982	5,203	11.9
January, 1983	6,226	11.9
February, 1983	4,897	11.9
March, 1983	6,010	12.0
April, 1983	4,628	12.0
May, 1983	4,548	12.0
TOTAL	77,347	11.9

TABLE 2

MEANS ON THE ARMED FORCES QUALIFICATION TEST SCORES FOR RECRUITS BY SIXTH READING GRADE LEVEL CRITERION AND MONTH OF ENTRY

Month	Reading Grade Level Criterion			
	Below 6.0		Above 6.0	
	N	Mean	N	Mean
June, 1982	282	34.0	7,378	58.4
July, 1982	300	32.7	7,161	57.4
August, 1982	363	33.5	9,097	58.8
September, 1982	275	32.9	7,751	58.2
October, 1982	349	38.3	5,986	59.0
November, 1982	400	48.1	6,493	59.7
December 1982	161	36.7	5,042	60.2
January, 1983	185	33.8	6,041	60.3
February, 1983	232	42.8	4,665	60.3
March, 1983	142	38.1	5,868	62.4
April, 1983	111	37.5	4,517	62.7
May, 1983	131	41.2	4,417	63.8
TOTAL	2,931	37.6	74,416	59.8

that the two RGL groups are reasonably distinct with regard to aptitude as assessed by the AFQT scores.

The medians and means on RGL for recruits by month of entry into the Navy are reported in Table 3. The median for the composite group was 11.4 RGL while the mean was 9.8 RGL. The monthly medians varied from a low of 10.5 RGL in July and October, 1982, to a high of 12.8 RGL in May, 1983. The means by month ranged from 9.5 RGL in October, 1982, to 10.2 RGL in March, 1983. While the monthly means showed a generally increasing trend across the twelve months, the monthly medians were appreciably high beginning in November, 1982, when multi-level testing with the Gates was initiated. The relatively large increase in medians as compared to the smaller increase in means when multi-level Gates testing began probably reflects greater precision in assessing RGL for recruits at the higher reading levels.

Hypothesis 1

There are no differences in the distributions of recruits classified by RGL category and month of entry into the Navy. Table 4 presents the frequency and percentage distributions of recruits by RGL category and month of entry. The data on the composite group for the one-year period revealed that 3.79 percent of the recruits had scores below the 6.0 RGL criterion - the criterion for referral to ART. The percentage of recruits who scored below the 6.0 RGL varied considerably across the twelve months as evidenced by a range from 2.36 percent in March, 1983, to 5.80 percent in November, 1982. The percentages of recruits who scored at or below the 8.0 RGL was 17.17 percent for the year with a monthly low of 9.80 percent in March, 1983, and a monthly high of 24.15 percent in July, 1982. The decrease of almost 9 percent that occurred between October and November, 1983, with the introduction of multi-level Gates testing began a general decline for the remainder of the year. Within the 8.1-10.0 and 10.1-12.0 RGL categories, the pecentages of recruits were lower in the months beginning with November, 1982, with the greater decrease occurring for the 8.1-10.0 RGL category. The percentage of recruits who had RGL scores above 12.0 was 39.01 percent for the year. An increase of approximately 20 percent occurred between October and November, 1982, and the higher percentage persisted throughout the rest of the one-year period. The Chi-square comparison of the RGL distributions of recruits by month of entry revealed highly significant differences across the twelve months, thereby leading to rejection of the null hypothesis tested at the .05 level of significance.

Hypothesis 2

There is no difference in the distributions of recruits classified by high school graduation status and month of entry into the Navy. The frequency and percentage distributions of recruits classified by high school graduation status and month of entry are reported in Table 5. The data for the composite group showed that more than 86 percent of the recruits were high school graduates. The monthly percentages revealed variability of about 7 percent, ranging from 83.33 percent in November, 1982, to 90.00 percent in May, 1983. The percentages exceeded 88 percent in August 1982, and February - May, 1983. The lowest percentages were in June and October-December, 1982. The comparison

TABLE 3

MEDIANS AND MEANS ON READING GRADE LEVEL FOR RECRUITS
BY MONTH OF ENTRY

Month	N	Median	Mean
June, 1982	7,660	10.8	9.7
July, 1982	7,461	10.5	9.6
August, 1982	9,460	10.6	9.7
September, 1982	8,026	10.7	9.8
October, 1982	6,335	10.5	9.5
November, 1982	6,893	12.1	9.7
December 1982	5,203	12.2	9.9
January, 1983	6,226	12.1	9.9
February, 1983	4,897	12.2	9.9
March, 1983	6,010	12.7	10.2
April, 1983	4,628	12.7	10.1
May, 1983	4,548	12.8	10.0
TOTAL	77,347	11.4	9.8

TABLE 4

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF RECRUITS
BY READING GRADE LEVEL AND MONTH OF ENTRY

Month	Reading Grade Level Category																Total
	Below 3.0		3.0-3.9		4.0-6.0		6.1-8.0		8.1-10.0		10.1-12.0		above 12.0				
	f	%	f	%	f	%	f	%	f	%	f	%	f	%			f
June, 1982	10	.13	24	.31	248	3.24	1,321	17.25	1,455	18.99	2,201	28.73	2,401	31.34			7,660
July, 1982	20	.27	27	.36	253	3.39	1,502	20.13	1,538	20.61	2,139	28.67	1,982	26.56			7,461
August, 1982	15	.16	21	.22	327	3.46	1,776	18.77	1,880	19.87	2,852	30.15	2,589	27.37			9,460
September, 1982	11	.14	27	.34	237	2.95	1,355	16.88	1,677	20.89	2,433	30.31	2,286	28.48			8,026
October, 1982	62	.98	56	.88	231	3.65	1,134	17.90	1,319	20.82	1,832	28.92	1,701	26.85			6,335
November, 1982	27	.39	137	1.99	236	3.42	615	8.92	993	14.41	1,663	24.13	3,222	46.74			6,893
December, 1982	16	.31	23	.44	122	2.34	490	9.42	781	15.01	1,215	23.35	2,556	49.13			5,203
January, 1983	15	.24	27	.43	143	2.30	626	10.05	908	14.58	1,560	25.06	2,947	47.33			6,226
February, 1983	74	1.51	40	.82	118	2.41	385	7.86	661	13.50	1,184	24.18	2,435	49.72			4,897
March, 1983	5	.08	23	.38	114	1.90	447	7.44	737	12.26	1,530	25.46	3,154	52.48			6,010
April, 1983	14	.30	20	.43	77	1.66	367	7.93	596	12.88	1,111	24.01	2,443	52.79			4,628
May, 1983	8	.18	23	.51	100	2.20	334	7.34	602	13.24	1,022	22.47	2,459	54.07			4,548
TOTAL	277	.36	448	.58	2,206	2.85	10,352	13.38	13,147	17.00	20,742	26.82	30,175	39.01			77,347

Chi-square = 5,345.848 (Chi-square = 85.82, df = 66, level of significance = .05)

TABLE 5

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF RECRUITS
BY HIGH SCHOOL GRADUATION STATUS AND MONTH OF ENTRY

	High School Graduate				
	Yes		No		Total
Month	f	%	f	%	f
June, 1982	6,236	84.11	1,178	15.89	7,414
July, 1982	6,209	85.99	1,012	14.01	7,221
August, 1982	8,081	88.12	1,089	11.88	9,170
September, 1982	6,822	87.44	980	12.56	7,802
October, 1982	5,164	83.89	992	16.11	6,156
November, 1982	5,549	83.33	1,110	16.67	6,659
December 19[illegible]	4,259	84.42	786	15.58	5,045
January, 1983	5,229	86.54	813	13.46	6,042
February, 1983	4,233	88.84	532	11.16	4,765
March, 1983	5,191	88.49	675	11.51	5,866
April, 1983	3,971	88.22	530	11.78	4,501
May, 1983	3,985	90.00	443	10.00	4,428
TOTAL	64,929	86.49	10,140	13.51	75,069

Chi-square = 272.041 (Chi-square = 19.68, df = 11, level of significance = .05)

of the frequency distributions of recruits on high school graduation status by month of entry utilizing the Chi-square technique indicated that the distributions differed very significantly based on the .05 level of significance. Therefore, the null hypothesis on distributions of recruits by high school graduation status and month of entry was rejected.

Hypothesis 3

There is no difference in the distributions of high school graduate recruits classified by the 6.0 RGL criterion and month of entry into the Navy. Table 6 contains the frequency and percentage distributions of high school graduate recruits by the 6.0 RGL criterion and month of entry into the Navy. The composite group data revealed that 3.91 percent of the high school graduate recruits scored below the 6.0 RGL on comprehension. The monthly percentages had a range from 2.41 percent in March, 1983, to 6.29 percent in November, 1982. Generally, the monthly percentages were lower after the first month of multi-level Gates testing in November, 1982. The results of the Chi-square comparison of the frequency distributions for high school graduate recruits by the 6.0 RGL criterion and month of entry showed that they differed very significantly at the .05 level of significance. Thus, the null hypothesis of no difference in the distributions was rejected.

Hypothesis 4

There is no difference in the distributions of non-high school graduate recruits classified by the 6.0 RGL criterion and month of entry into the Navy. The frequency and percentage distributions of non-high school graduate recruits by the 6.0 RGL criterion and month of entry into the Navy are depicted in Table 7. In the composite group, 2.24 percent of the recruits who were not high school graduates scored below the 6.0 RGL on comprehension. The monthly percentages varied from a low of 1.13 percent in April, 1983, to a high of 4.23 percent in October, 1982. The percentages by month were higher than the annual percentage in only three months (October - December, 1982). The Chi-square comparison of the frequency distributions of non-high school graduates by the 6.0 RGL criterion and month of entry revealed that they differed significantly at the .05 level of significance. Consequently, the null hypothesis that the distributions are not different was rejected.

Hypothesis 5

There is no difference in the distributions of recruits scoring below the 6.0 RGL criterion classified by high school graduation status and month of entry into the Navy. The frequency and percentage distributions are reported in Table 8 for the recruits who scored below the 6.0 RGL classified by high school graduation status and month of entry into the Navy. The data indicated that 91.80 percent of the recruits who obtained scores below the 6.0 RGL in comprehension were high school graduates. The monthly percentages had a range from 81.76 pecent in December, 1982, to 95.16 percent in May, 1983. The percentages tended to be lower in October-December, 1982, and to be higher in the earlier and latter months of the one-year period. The comparison of the

TABLE 6

FREQUENCY AND PECENTAGE DISTRIBUTIONS OF HIGH SCHOOL GRADUATE RECRUITS BY SIXTH READING GRADE LEVEL CRITERION AND MONTH OF ENTRY

Month	Reading Grade Level Criterion: Below 6.0 f	Below 6.0 %	Above 6.0 f	Above 6.0 %	Total f
June, 1982	237	3.80	5,999	96.20	6,236
July, 1982	263	4.24	5,946	95.76	6,209
August, 1982	325	4.02	7,756	95.98	8,081
September, 1982	245	3.59	6,577	96.41	6,822
October, 1982	295	5.71	4,869	94.29	5,164
November, 1982	349	6.29	5,200	93.71	5,549
December 1982	121	2.84	4,138	97.16	4,259
January, 1983	160	3.06	5,069	96.94	5,229
February, 1983	205	4.84	4,028	95.16	4,233
March, 1983	125	2.41	5,066	97.59	5,191
April, 1983	98	2.47	3,873	97.53	3,971
May, 1983	118	2.96	3,867	97.04	3,985
TOTAL	2,541	3.91	62,388	96.09	64,929

Chi-square = 227.554 (Chi-square = 19.68, df = 11, level of significance = .05)

TABLE 7

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF NON-HIGH SCHOOL GRADUATE RECRUITS BY SIXTH GRADE LEVEL CRITERION AND MONTH OF ENTRY

	Reading Grade Level Criterion				
Month	Below 6.0		Above 6.0		Total
	f	%	f	%	f
June, 1982	24	2.04	1,154	97.96	1,178
July, 1982	22	2.17	990	97.83	1,012
August, 1982	17	1.56	1,072	98.44	1,089
September, 1982	14	1.43	966	98.57	980
October, 1982	42	4.23	950	95.77	992
November, 1982	35	3.15	1,075	96.85	1,110
December 1982	27	3.44	759	96.56	786
January, 1983	14	1.72	799	98.28	813
February, 1983	11	2.07	521	97.93	532
March, 1983	9	1.33	666	98.67	675
April, 1983	6	1.13	524	98.87	530
May, 1983	6	1.35	437	98.65	443
TOTAL	227	2.24	9,913	97.76	10,140

Chi-square = 41.088 (Chi-square = 19.68, df = 11, level of significance = .05)

TABLE 8

FREQUENCY AND PERCENTAGE DISTIRBUTIONS OF RECRUITS SCORING BELOW SIXTH READING GRADE LEVEL BY HIGH SCHOOL GRADUATION STATUS AND MONTH OF ENTRY

	High School Graduate				
	Yes		No		Total
Month	f	%	f	%	f
June, 1982	237	90.80	24	9.20	261
July, 1982	263	92.28	22	7.72	285
August, 1982	325	95.03	17	4.97	342
September, 1982	245	94.59	14	5.41	259
October, 1982	295	87.54	42	12.46	337
November, 1982	349	90.89	35	9.11	384
December 1982	121	81.76	27	18.24	148
January, 1983	160	91.95	14	8.05	174
February, 1983	205	94.91	11	5.09	216
March, 1983	125	93.28	9	6.72	134
April, 1983	98	94.23	6	5.77	104
May, 1983	118	95.16	6	4.84	124
TOTAL	2,541	91.80	227	8.20	2,768

Chi-square = 42.243 (Chi-square = 1 68, df = 11, level of significance = .05)

frequency distributions of recruits who scored below the 6.0 RGL classified by high school graduation status and month of entry using the Chi-square technique showed that they differed significantly at the .05 level of significance. Therefore, the null hypothesis of no difference in the distributions was rejected.

Hypothesis 5

There is no difference in the proportions of high school graduate and non-high school graduate recruits who score below the 6.0 RGL criterion. Table 9 contains the proportions of recruits who scored below the 6.0 RGL classified by high school graduation status and month of entry into the Navy. The data on the proportions of recruits who scored below the 6.0 RGL are discussed above as percentages for high school graduates and non-high school graduates separately. An inspection of the relative proportions of the two groups revealed that a higher proportion (.0167) of the high school graduates than non-high school graduates obtained scores below the 6.0 RGL criterion for the one-year period. In eleven of the twelve months (except for December, 1982), the high school graduates had the higher proportion. The confidence limits comparing the difference in the proportions for the composite groups indicated that the overall proportions differed significantly at the .05 level of significance because the limits did not include 0 within the range. The differences were also significant for six of the twelve months. In all cases where significant differences were found, the proportions were higher for the high school graduates than the corresponding proportions for the non-high school graduates. The results of comparing the proportions for the two composite groups necessitated rejection of the null hypothesis of no difference in the proportions at the .05 level of significance.

Conclusions

The Navy's recruit population is described in this study utilizing data on selected variables that apply to the recruits entering the Navy during a twelve-month period of time. The conclusions are derived from the descriptive analyses and the results of testing six hypotheses pertaining to specific variables.

With regard to years of education, the typical Navy recruit has completed almost twelve years of education. Six-sevenths of the recruits are high school graduates. The inferential analysis on high school graduation status indicates that higher percentages of high school graduates are included among the recruits in the summer, late winter, and spring months of the year.

The aptitude of recruits as reflected by means on the AFQT does not appear to vary in any consistent pattern among the recruits with RGL scores below 6.0 but seems to show an increasing trend among the recruits with RGL scores above 6.0. The means indicate that recruits who score above the 6.0 criterion have greater aptitude than recruits who score below the 6.0 RGL criterion. The difference in the aptitude score means for the two groups suggests that they are dissimilar populations.

TABLE 9

COMPARISON OF PROPORTIONS OF RECRUITS SCORING BELOW SIXTH READING GRADE LEVEL BY HIGH SCHOOL GRADUATION STATUS AND MONTH OF ENTRY

	High School Graduate				Confidence Limits		
	Yes		No		.025	to	.975
Month	N	p	N	p			
June, 1982	6,276	.0380	1,178	.0204	.0083	to	.0269
July, 1982	6,209	.0424	1,012	.0217	.0116	to	.0298
August, 1982	8,081	.0402	1,089	.0156	.0161	to	.0331
September, 1982	6,822	.0359	980	.0143	.0094	to	.0338
October, 1982	5,164	.0571	992	.0423	-.0050	to	.3463
November, 1982	5,549	.0629	1,110	.0315	.0143	to	.0485
December 1982	4,259	.0284	786	.0344	-.0253	to	.0133
January, 1983	5,229	.0306	813	.0172	-.0008	to	.0276
February, 1983	4,233	.0484	532	.0207	.0083	to	.0471
March, 1983	5,191	.0241	675	.0133	-.0028	to	.0244
April, 1983	3,971	.0247	530	.0113	-.0010	to	.0278
May, 1983	3,985	.0296	443	.0135	-.0008	to	.0330
TOTAL	64,929	.0391	10,140	.0224	.0125	to	.0199

The reading comprehension means of recruits exhibit relative stability across the twelve-month period, placing the composite group near the tenth grade level. The median reveals a disjuncture with the introduction of multi-level Gates testing in November, 1982. Prior to this time, the median was in the tenth grade range while it was in the twelfth grade range afterward. The median for the year places the group near the mid-eleventh grade level. The median for the composite group shows a continuation of a slight trend toward higher comprehension levels among recruits as reported by Bowman and Kerr for the two preceding twleve-month periods (2, 3).

The frequency distributions of recruits by RGL categories reveal differences in the composition of the recruit groups when considered by month of entry into the Navy. Separate analyses of the distributions of high school graduate and non-high school graduate recruits classified by the 6.0 RGL criterion and month of entry indicate that differences also exist across the twelve-month period within each group. Among the high school graduates, the percentages who score below the 6.0 RGL are generally lower after the beginning of multi-level Gates testing. While a similar pattern is not clearly discernible among the non-high school graduates, the lowest percentages are reported for the last three months of the period.

Differences exist in the twelve-month distributions of recruits who obtain RGL scores below 6.0 when classified by high school graduation status and month of entry into the Navy. Higher percentages of the recruits who score below the 6.0 RGL are high school graduates in the earlier and latter months of the period than in the middle months. A higher proportion of the composite group of high school graduate recruits score below the 6.0 RGL than is found in the composite group of non-high school graduate recruits. Significant differences exist for the composite groups and for the monthly groups in half of the twelve months.

An inequity exists between the proportion of high school graduates among the recruits who score below the 6.0 RGL (eleven-twelfths) and the proportion of all recruits who are high school graduates (six-sevenths). If the proportion of high school graduates among the recruits with RGL scores below 6.0 had been the same as the proportion of high school graduates among all recruits, 147 fewer recruits with RGL scores below 6.0 would have been high school graduates. Additionally, the percentage of high school graduate recruits who scored below 6.0 RGL is 1.67 percent higher than the percentage for non-high school graduates. If the percentage for high school graduates had been the same as the percentage for non-high school graduates, 1,087 fewer recruits would have scored below the 6.0 RGL.

The findings suggest that the recruit population remains relatively stable while showing slight positive trends with regard to means on years of education, reading comprehension skills, and aptitude scores. Several variables reveal variability across the twelve-month period. Factors for which distributions by month differ include RGL scores, high school graduation status, high school graduate and non-high school graduate recruits who score above and below the 6.0 RGL criterion, and high school graduation status of recruits who score below the 6.0 RGL. The proportion of recruits who obtain RGL scores below 6.0 also is higher for high school graduates than for non-high school graduates.

This study indicates that the recruits who enter the Navy are likely to vary in different months of the year on some important factors. As a result, ART management personnel need to plan for adjustments in the requirements for resources as the recruit population changes throughout the year. By being aware of the variability in demands, more efficient allocation and utilization of the resources can be achieved for ART and the Recruit Training Commands. The study also demonstrates that information is available through the monthly CMI reports on Navy recruit characteristics to improve the effectiveness of program management. Consistent monitoring of these reports and basic analyses of the data would enable the staff to determine the changes occurring in the composition of the recruit population that affect the ART Program.

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